Denominal Verbs and Their Cognate Prepositional Phrases

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1. Introduction

Denominal verbs in English often appear with a prepositional phrase in which a noun-head in the NP complement is semantically cognate with the verbs. In this study, we will refer to such a sentence as the cognate prepositional phrase (CPP) construction (cf. Levin (1993)).[2] Some examples are listed below.

(1) a. He *shelved* the book (on the top *shelf*).
He *pocketed* the change (in his coat *pocket*).
b. He *saddled* the horse (with a western *saddle*).
He *buttered* his bread (with unsalted *butter*).
c. She *combed* her hair (with a tortoise-shell *comb*).

This paper discusses the distribution of CPPs. It is organized as follows: Section 2 starts with an introduction of a pragmatic constraint on the construction which utilizes the notion of informativity. We will see that this constraint is insufficient, though necessary, to deal fully with the distribution of CPPs. In section 3, we will review a cognitive and a syntactic approach to the construction. Specifically, we will take Kageyama's (1997) and Hale and Keyser's (1997) analyses, and point out that they have some conceptual and empirical problems. In section 4, I will provide a syntactic analysis, which is basically an extension of Hale and Keyser's analysis. Section 5 makes concluding remarks.

2. Unacceptable CPPs

As is often pointed out in the literature, denominal verbs are not always allowed to take CPPs. Before clarifying the distribution of CPPs, it

must be noted, as a preliminary, that the CPP construction must meet the requirement of informativity. The informativity requirement is not a mere tool for the CPP construction alone, but a rather general requirement in natural languages. This requirement can be stated like this : if some linguistic form is used in a sentence, it must carry additional information to the construction containing it. Thus, for example, *John kicked the ball with his wounded foot* is acceptable whereas **John kicked the ball with his foot*, because the PP in the latter example does not serve any additional information. The cognate object (CO) construction is also under this requirement, and thus, **John dreamed a dream* but *John dreamed a fearful dream*. As is the case with the CO construction, this requirement demands additional information from the (cognate) PP : as for the CPP construction, Levin states as follows :

(2) [C]ognate prepositional phrases are typically most acceptable if they contribute additional information through the use of a modifier of some kind. (Levin (1993 : 97))

Thus, the sentences in (3) are all ruled out, because the prepositional phrases do not add any information to (the nominal component of) the meaning of the verbs.

(3) a . *He shelved the book on a shelf.
*He pocketed the change in her pocket.
b . *He saddled the horse with a saddle.
*He buttered his bread with butter.
c . *She combed her hair with a comb.

The requirement as in (2) is, however, just a necessary condition and it is not sufficient to explain all unacceptable examples of the CPP construction. Actually, there are examples of this construction in which the NPs in the CPPs are considered informative enough. Consider the following examples.

(4) *John skinned the banana of its smooth yellow skin.

(5) a . *The cook boned the fish of its backbone.
b . *The cook deboned the fish of all its bones.
c . *The farmer skinned the pig of its blotched skin.

(6) a. *The cow calved of a blind calf.
b. *The dog whelped of five shaggy dogs.

It is clear that the NP complements in the CPPs above contain more information than (the nominal component of) the verbs do. The NP in (5a) *its backbone*, for example, provides an additional piece of information, specifying which part of the bones are taken out of the fish. However, the sentences are much less acceptable than those in (1), which shows that the informativity requirement is not enough.

According to Levin (1993), verbs which cannot even accompany informative CPPs contain the following verb classes : *pit* verbs, (*de*)*bone* verbs, and *calve* verbs. The verbs in (4)–(6) fall into each of these three classes. As we will see below, verbs of these classes may take cognate objects (COs). Interestingly, verbs which are allowed to take CPPs (such as *butter* verbs (locatum verbs), *pocket* verbs (location verbs), and *captain* verbs (agentive verbs)) cannot take COs.[3]

(7) a. We buttered the bread with unsalted butter/cheap margarine.
a'. *We buttered unsalted butter/cheap margarine on the bread.
b. Mary pocketed change in her coat pocket. (cf. Kiparsky (1997))
b'.*Mary pocketed her coat pocket with change.
c. John tutored the boy as an English tutor/a part-time tutor.
c'.*John tutored an English tutor/a part-time tutor to the boy.

Then, even when converted nouns may be externally realized as cognate expressions, the choice between COs and CPPs is determined for each class of verbs.[4] In other words, each verb class has its own way of external expression. This further implies that the choice is directly related to the lexical conceptual structure (LCS) of each verb class. In the following section, we will review Kageyama (1997) and Hale and Keyser (1997), both of which pursue the relationship between the external expression of a converted noun and the LCS of the denominal verb and try to explain

the distribution of CPPs. Then, I will point out some problems involved in each analysis. The final goal of this paper is the same as is aimed at in Kageyama (1997) and Hale and Keyser (1997), namely, to clarify the factors which would fill the gap in the analysis based on the informativity requirement.

3. Previous Analyses

3.1. Kageyama (1997)

3.1.1. The Notion of Salience and CPPs

Kageyama claims that conversion from nouns to verbs is sensitive to the degree of 'salience' of the converted noun. According to the generalization he draws, nominal expressions which are less salient have more chances to be converted into verbs. Kageyama assumes the hierarchy of salience in which the 'external argument' is the highest argument. Next ranked is the 'internal argument', then 'prepositional complements', and finally '(pure) adjuncts'. Productivity of denominal verbs, i.e., convertibility into verbs, is in the opposite order: nominals in pure adjuncts are most easily converted into verbs; then prepositional complements, the internal argument, and finally the external argument. (As for the external argument, there is no chance for conversion.)

Kageyama claims that denominal verbs converted from prepositional complements or adjuncts involve instrumental verbs, agentive verbs, location verbs, and locatum verbs. Each verb class is exemplified in (8) and the LCS of each class is in (9).[5]

(8) a. She combed her hair.
b. Mary mothered the child.
c. John shelved the books.
d. She buttered her bread.

(9) a. Instrumental verbs: [ ]$_x$ ACT ON–[ ]$_y$ BY–MEANS–OF–[Noun]$_z$
b. Agentive verbs: [ ]$_x$ ACT ON–[ ]$_y$ AS/LIKE–[Noun]$_z$
c. Location verbs: [ ]$_x$ CAUSE [BECOME [[ ]$_y$ BE AT–[Noun]$_z$]]

d. Locatum verbs: [ ]$_x$ CAUSE [BECOME [[ ]$_y$ BE WITH-[Noun]$_z$]]

Examples with denominal verbs converted from internal arguments and their LCSs are in (10) and (11–12).

(10) a. The hunter skinned the rabbit.
b. The cow calved.

(11) *skin*: [ ]$_x$ CAUSE [BECOME [SKIN-of [ ]$_y$ BE [NOT [AT-ON-y]]]][6]

(12) *calve*: [ ]$_x$ CAUSE [BECOME [CALF BE NOT-AT-IN-x]][7]

Regarding externalization of the converted noun, Kageyama describes a tendency of each level of conversion.[8] He points out that externalization of the nominals which are lexicalized into verbs depends on the convertibility of the nominals (i.e., productivity of denominal verbs) (p.41). His claim is that the high productivity of denominal verbs induces the high acceptability of externalization of the converted nominal, and the less productivity induces the less acceptability of externalization. Thus, the nominals of denominal verbs converted from adjuncts are most likely to be externalized; those from prepositional complements and from internal arguments come next in that order.

3.1.2. Problems with Kageyama's Analysis

Although Kageyama's generalizations concerning the productivity of denominal verbs and acceptability of externalization appear to capture the fact, they have some conceptual and empirical problems. Firstly, it should be asked why it is that the way of syntactic realization of a nominal expression controls conversion into verbs (and further, externalization of the converted nominals)? Moreover, what underlies the generalization that less salient nominals (which are thus easily converted into verbs) *re-* appear more easily as cognate externalized expressions?

Besides the conceptual problems with the generalizations on the productivity of denominal verbs and on externalization of converted nominals, Kageyama's analysis also contains some empirical problems. A first question goes to his evidence for the generalization on the productivity of denominal verbs. Specifically, his claim that an internal argument in the

LCS is less likely to be converted into verbs is dubious. Kageyama claims that the most acceptable externalization is the *with* phrase of instrumental verbs, and then of location and locatum verbs; on the other hand, when denominal verbs (e.g., *skin* of the *pit/(de)bone* verb class and *calve*) take an object (internal argument) cognate to the verbs, the doubling effect sounds highly stylistic; thus, **skin the skin* (Kageyama (1997: 41)).

Although Kageyama provides this example as a piece of evidence for the hierarchy of externalization, the validity of examples of this kind is a question mark. We should remember here that externalized cognate expressions must meet the informativity requirement and be informative enough, as discussed in Section 2. Thus, the reason why the example in question is ruled out is simply that the cognate object in it (*the skin*) does not carry any additional information. Actually, as Kageyama himself points out, the example improves in the following example.

(13) a. Bill skinned the smooth yellow skin of the banana.
b. She boned all the small bones of the fish.
(Kageyama (1997))

This means that if the informativity requirement is satisfied, even denominal verbs from internal arguments (i.e., *pit/(de)bone* class of verbs) may take cognate expressions (as COs). Then, the example **skin the skin* tells nothing about the distribution of cognate expressions, because it is ruled out for some pragmatic reasons. Thus, the generalization drawn from the relation between externalization of cognate expressions and the productivity of denominal verbs (or further the salience of a nominal expression, as we have seen above) is questionable. The same can be said with *calve* verbs, which, according to Kageyama, is another class of denominal verbs converted from internal arguments. Some examples with a *calve* class verb are listed below, where externalizing cognate expressions (here again as COs) is acceptable. These examples can be qualified again as a piece of evidence against Kageyama's generalizations.[9]

(14) a. The cow calved (?a blind calf).
b. The dog whelped (five white dogs/?puppies).
c. They all come on shore in December, to whelp their young.

(*OED*)

A second problem we would like to point out is with the syntactic realization of adjuncts. Kageyama's analysis wrongly predicts that some adjuncts should be realized as CPPs headed by the preposition *from*. Kageyama proposes the LCS of the verb *skin*, a *pit/(de)bone* class verb, is something like the one in (11), repeated here as (15).

(15) *skin* : [ ]$_x$ CAUSE [BECOME [SKIN–of [ ]$_y$ BE [NOT [AT–ON–y]]]]

At the same time, he argues that the string of the lexical functions NOT–AT–IN/ON in the LCS is syntactically realized as *from*.[10] Thus, following Kageyama, we predict that *pit/(de)bone* verbs are compatible with a *from*–headed CPP, which is contrary to the fact.

(16) a . ?*Bill skinned the smooth yellow skin from the banana.
b . ?*She boned all the small bones from the fish.

We also predict that *calve* verbs could take a *from*–headed CPP, since he proposes the following LCS for the verb *calve* : [ ]$_x$ CAUSE [BECOME [CALVE BE NOT–AT–IN–x]]]]. Again, the prediction is wrong, however.

(17) *The cow calved from itself.[11]

Thus, not only the generalizations we saw above but also the lexical rewriting system has a problem in it.[12]

Thirdly, Kageyama's cognitive approach overgenerates denominal verbs from adjuncts. Given the LCS in (11–12), for example, we predict that the NPs in the adjunct position, namely *y* in (11) and *x* in (12), could be more easily converted into verbs. Thus, verbs such as those in (18) and (19) could be derived.

(18) a . *John fished (all the small bones). (cf. John boned the fish.)
b . *John foxed (the skin). (cf. John skinned the fox.)
c . *John bananaed (the skin). (cf. John skinned the banana.)

(19) *The red cow cowed a blind calf.
(cf. The red cow calved a blind calf.)

The unacceptability of verbs of this type reveals that the cognitive approach in Kageyama (1997) is not restrictive enough to capture the fact.

The last problem we would like to point out with Kageyama's analy-

sis is concerned with the so-called 'holistic effect' (cf. Rappaport and Levin (1988)). The holistic effect is observed with the object NPs of the two syntactic realizations in the locative alternation. In the syntactic frame of *NP V NP$_1$ onto NP$_2$*, as in (20 a), NP$_1$ (*the hay*) receives the holistic interpretation whereas NP$_2$ (*the truck*) does not. On the other hand, in the frame of *NP V NP$_2$ with NP$_1$*, as in (20 b), NP$_2$ (*the truck*), but not NP$_1$ (*the hay*), receives the holistic interpretation. Thus the sentences in (20) implies (20'a) and (20'b), respectively.

(20) a. I loaded the hay onto the truck.
b. I loaded the truck with the hay.

(20') a. All the hay is loaded into the truck. The truck need not be completely loaded.
b. The truck is completely loaded. There may be unloaded hay left over.

Further, this holistic effect in the object NPs of the locative alternation determines the aspect of the denoted event, and controls selection of temporal PPs. In other words, the first NP following the verb (i.e., the object NP) functions as an incremental theme in both of the frames. Thus, the choice for temporal PPs between *for* PP or *in* PP depends on the meaning of the objects : in the frame of *V NP$_1$ onto NP$_2$* (21 b, d), NP$_1$ is in control of the temporal phrase ; in the frame of *V NP$_2$ with NP$_1$* (21 a, c), NP$_2$ is in control of it.

(21) a. John sprayed this wall with paint in an hour/(#)for an hour. (OK, but atelic)
b. John sprayed paint onto this wall #in an hour/for an hour.
c. John sprayed subway cars with this can of paint #in an hour/for an hour.
d. John sprayed this (whole) can of paint onto subway cars in an hour/#for an hour.

Baker (1997 : 86 ff.) discusses syntactic and semantic differences between verbs in the locative alternation and verbs in the dative alternation (including the benefactive alternation), and argues, in passing, for a close connection between the syntactic position of a NP and its (non-)holistic

interpretation. He points out that the dative alternation, exemplified in (22), shows different behavior to the holistic effect.

(22) a. I gave the candy to the children.
b. I gave the children the candy.

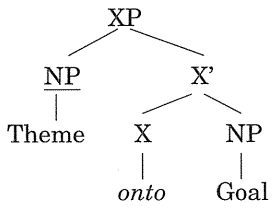
Now consider the following paradigm, corresponding to the sentences in (21) but different only in using the verb *read*, which induces the dative alternation.

(23) a. I have read stories to the children for an hour/#in an hour.
b. I have read the children stories for an hour/#in an hour.
c. I have read the story to children ?for an hour/in an hour.
d. I have read children the story ?for an hour/in an hour.

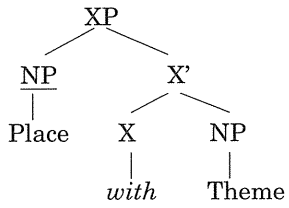
These sentences show that the NP the *story/stories,* no matter where it is located (i.e., irrespective of the occurrence of the alternation), functions as an incremental theme and controls the temporal phrase : if it is definite, the *in* phrase is selected and if indefinite, the *for* phrase is selected.

Based on this fact (and some other syntactic pieces of evidence), Baker argues that the locative alternation involves two distinct base structures, whereas the dative alternation involves only one.[13] The two base structures of the former are (1) *V NP (Theme) onto NP (Goal)* and (2) *V NP (Place) with NP (Theme).* The structure of the latter is *V NP (Theme) to/for NP (Goal)* and the other alternative frame of the alternation (i.e., the double object construction *(V NP (Goal) NP (Theme))* is derived through some syntactic operation. What Baker attempts in his analysis of the two alternations is to connect the holistic interpretation of a NP to a certain specific syntactic position. Baker's intuitive idea about the holistic effect is that NPs which receive the holistic interpretation appear in the Spec(ifier) position of the lower XP (which approximately corresponds to post verbal constituents) of the base structure. With tree diagrams, the NPs which receive the holistic interpretation can be represented as follows. The two structures in (24) correspond to the two constructions of the locative alternation ; the one in (25) corresponds to the (only) base structure of the dative alternation. The nominals which receive the holistic interpretation are indicated with underline.

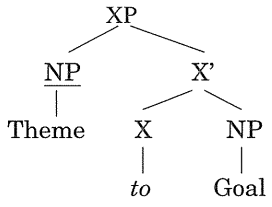
(24) a.



b.



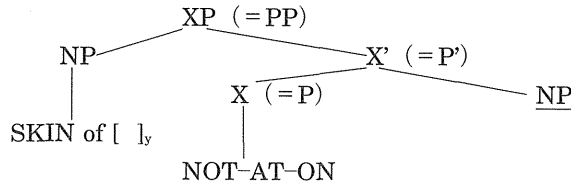
(25)



Now let us compare *butter* class verbs (i.e., Kageyama's locatum verbs) and *pit/(de)bone* verbs. Kageyama proposes the LCSs in (9d) and (11) for these classes of verbs, respectively. Assuming the close relationship between the (non–)holistic interpretation and the position of the relevant NP in the LCS, and given the LCS in (9d) for *butter* verbs, we predict that the object NPs in both of the syntactic realizations receive the holistic interpretation. Concerning the semantic properties of *butter* verbs, Levin (1993) states that the object of *butter* verbs have some semantic properties which are shared with *spray/load* verbs and *fill* verbs, and particularly, the objects of the verbs receive the holistic interpretation. Thus, the interpretation of the object NP in the sentence *Lora buttered the toast* receives a holistic interpretation and the sentence can be paraphrased as "Lora made the whole part of the toast covered with butter" (Levin (1993 : 121), cf. Buck (1993)). This is consistent with Baker's analysis. How about *pit/(de)bone* verbs? Again, according to Levin, the direct object *the fish* in *The cook (de)boned the fish* receives the holistic interpretation, associated with the *with/of* variant of the locative alternation. He interprets the sentence as follows : if a cook (de)bones a fish, all of the bones are understood to have been removed (cf. Levin (1993 : 130 f.)). Restating this interpretation from the point of view of the direct object, the sentence can be paraphrased in this way : the cook made the

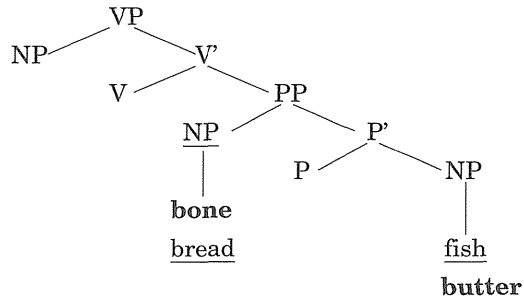
whole part of the fish boneless. Then, if we assume the LCS that Kageyama (1997) proposes for the verb, we cannot hold the simple syntactic account of the holistic effect. (The LCS is repeated below, with the projection of its relevant part into a tree diagram.)

(15') *skin* : [ ]$_x$ CAUSE [BECOME [SKIN–of [ ]$_y$ BE [NOT AT–ON–y]]]]



Assuming Baker's (1997) line of analysis, that is, assuming that the holistic effect depends on the syntactic position of a NP, the LCS of *pit/(de–) bone* verbs in (15) is problematic. With a tree diagram, the contrast between the verbs *butter* and *bone* (i.e., *butter* class verbs vs. *pit/(de)bone* class verbs) can be summarized as in (26), where the NPs which receive the holistic interpretation is underlined and the nouns which are converted into verbs are in boldface.

(26) *Butter* vs. *Pit/(De)bone* Verbs (cf. Kageyama (1997)) :



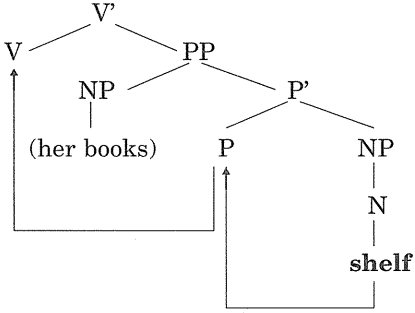
What we ideally want is that in the case of *pit/(de)bone* verbs the two NPs should be inverted and the constant **bone** should be within the internal predicate (P') in the LCS.

3.2. Hale and Keyser (1993, 1997)

3.2.1. Noun–Incorporation and Denominal Verbs

In the series of their analyses, Hale and Keyser (H&K) argue that argument structure of verbs are derived syntactically. Specifically, denominal verbs are results of head–movement (i.e., N(oun)–incorporation) in the lexical relational structure (LRS); the verb *shelve* is derived in the following manner.[14]

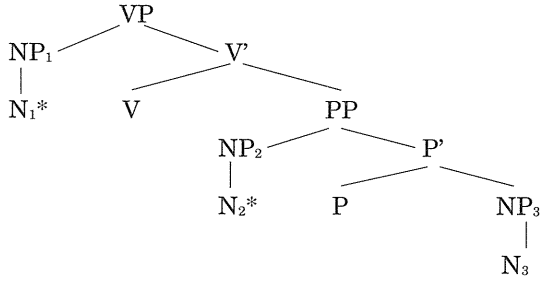
(27) *shelve* :



(cf. H&K (1993))

The constraint on head–movement rules out denominal verbs the incorporated N–head of which comes from the N_1 position and the N_2 position in (28).[15]

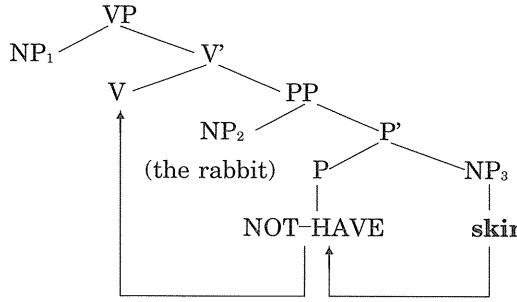
(28)



As for verbs of the *pit/(de)bone* class (e.g., *skin, bone, peel*), H&K (1997) stipulate that the verbs have a 'negative' version of the LRS of *butter* class verbs, which can be represented as in (29b).

(29) a. skin the rabbit

b.

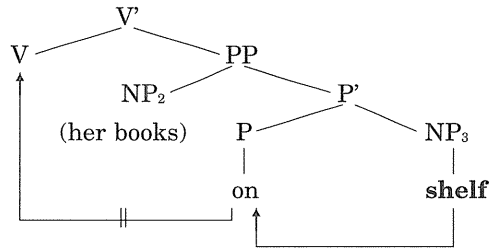


(cf. H&K (1997))

As actual devices for externalization of cognate expressions, H&K (1997) assumes that they are results of 'index deletion' and 'lexical insertion' (e.g., DP insertion) (cf. H&K (1997 : 42) ; Kiparsky (1997)). The operation of N movement, as indicated in (27) or (29b), leaves indices. The operation of index deletion is an optional operation to delete the index (or, intuitively speaking, to cut a link of the movement chain). S–syntactically (i.e., in forming a d–structure of a sentence) the chain link (s) separated by index deletion is realized through lexical insertion (see H&K (1997 : 42)). Let us take the verb phrase *shelve the book on the top shelf* as an example.

(30) a. She shelved her books (on the top shelf).

b.



The LRS of the verb *shelve* is as in (27), repeated here as (30b), and the verb is derived through two steps of N–incorporation. If the operation of index deletion applies, if the link of the chain is cut between the P–head and the V–head, the separated part, namely PP ([P NP]), can be realized

as *on the top shelf* through lexical insertion.

3.2.2. Problems with Hale and Keyser's Analysis

H&K's analysis also has some problems. The problems are with the *pit/(de)bone* class of verbs. Firstly, H&K's analysis cannot explain some denominal verbs cannot take a CPP. For example, *pit/(de)bone* verbs, for which they propose the LRS as in (29b), is expected under their analysis, to take a CPP, i.e., the P (NOT–HAVE) and its complement NP_3 (**skin**) could be overtly realized. This is not the case, however. Consider the following examples.

(31) a . *The cook (de)boned the fish of its back bone.
b . *Bill skinned the banana of its smooth yellow skin.
(Jackendoff (1990))

(32) a . *John (de)boned the fish without all of its small bones.
b . *John skinned the banana without its smooth yellow skin.

These examples require that either the mechanism of externalization of cognate expressions or the LRS in (29b) for *pit/(de)bone* verbs should be reconsidered.

Secondly, verbs of the class in question may take a CO.

(33) a . Bill skinned the smooth yellow skin of the banana.
b . She boned all the small bones of the fish.

This is surprising, because under H&K's analysis NPs which are syntactically realized as objects (as *her books* in (30) and *the rabbit* in (29)) are originally base–generated in the Spec (NP_2) position. The question is this : how is it possible that NP_3 in the P complement position is syntactically realized as a (cognate) object? Where is the NP_2 in the LRS gone in this case? If we assume the structure in (29b) (and syntactic operations such as N–incorporation), we expect the result should contain NP_2 but not NP_3 as objects. In other words, *pit/(de)bone* verbs could appear in the double object construction, with the second object being a CO, but this is not the case.

(34) a . *John boned the fish all the small bones.
b . *John skinned the banana its smooth yellow skin.

These considerations suggest that in (29b), the NP_2 *the rabbit* and NP_3

skin should be inverted, as is proposed in Kageyama's analysis. Then, we are now faced with a contradiction : while some observations suggest for *pit/(de)bone* verbs the base structure proposed in Kageyama (1997), others suggest the structure in H&K (1997).

4. An Analysis : Generating *Pit/(De)bone* Verbs and Externalizing Their Cognate Expressions

In this section we propose our analysis of denominal verbs and externalization of converted Ns. In particular, we will see that our analysis will explain the fact that verbs of the *pit/(de)bone* class do not take a CPP, but a CO as an external expression. Specifically, we pursue the syntactic approach taken in H&K (1993, 1997).

One of the issues concerning denominal verbs of the *pit/(de)bone* class was the linear order in the base structure of the NP denoting the whole part of an entity (e.g., *the fish*) and the NP denoting a part of the entity (e.g., *its backbone*). Kageyama (1997) proposes the order of NP〈part〉–NP〈whole〉 in the base structure (LCS), while the reversed order NP〈whole〉–NP〈part〉 is proposed in H&K (1997). We consider that the solution lies in the following examples.

(35) a . ?*Bill skinned the smooth yellow skin from the banana.
b . ?*She boned all the small bones from the fish.

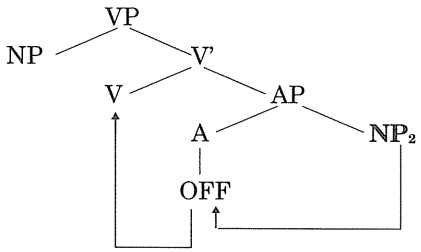
These sentences have been provided as problematic examples for the rewriting mechanism of adjuncts. We consider that the sentences do not merely raise a question on the rewriting mechanism in Kageyama's analysis but provides a clue to the base structure of the verb class in question : the sentences in (35) can be interpreted as implying the base structure of the verbs. That is, their unacceptability implies that the base structure is NP_1〈whole〉–NP_2〈part〉 but not NP_1〈part〉–NP_2〈whole〉. By assuming that the linear order in the base structure (LCS/LRS) is reflected on the surface order of the two NPs, the unacceptability of the sentences above can be easily accounted for ; and the second empirical problem with Kageyama's analysis is resolved.

By basically positing the LRS proposed in H&K (1997) for *pit/(de–)*

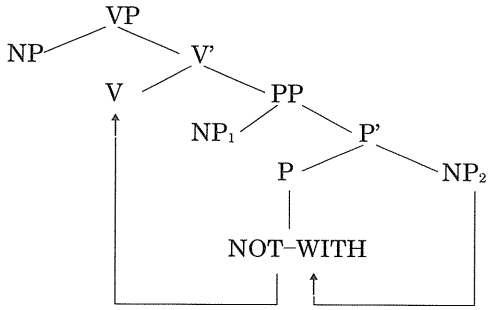
bone verbs, the problems with Kageyama's analysis, pointed out above, are also resolved.[16] The problem of overgeneration of denominal verbs (e.g., **fish*) is also resolved. That is because the noun *fish*, in this case, is base generated in NP_1 position in the LRS, from which N–incorporation is impossible because of the constraint on head movement (cf. (28)); hence follows the unacceptability of the verb *fish* in the sense intended here. The problem concerning the holistic effect is also explained. By positing the LRS in H&K (1997) again, NPs which are syntactically realized as objects are uniformly base–generated in NP_1 position, where NPs in this position are to receive the holistic interpretation. (It should be noticed here that the first empirical question about Kageyama's analysis is also resolved, because with the assumption of the NP_1⟨whole⟩–NP_2⟨part⟩ order in the base structure, we need not 'underestimate' the productivity of denominal verbs such as *skin* any more.) Then, what we really have to deal with is the problems pointed out in 3.2.

What we should take into consideration is the fact that *pit/(de)bone* class of verbs has two alternations with regard to whether they take NP_1 ⟨whole⟩. It does not seem unreasonable, then, to conjecture that there are two different base structures (LRSs) for the verbs, as is assumed with the verbs which appear in the locative alternation. To solve the problem, I propose that the internal predication of the relevant verbs (corresponding to the post verbal constituents) is of either AP– or PP–type. The verb *skin,* for example, has either of the following two structures as its LRS. (Here again, the nominals to be converted into verbs are in boldface.)[17]

(36) *Pit/(De)bone* Verbs (1):



(37) *Pit/(De)bone* Verbs (2) :



Let us start with the structure in (36), which does not contain NP_1 unlike the one in (37). The AP in (36) denotes a situation in which an entity (NP_2) is in or come into a state of being disconnected or removed.[18,19] Assuming the LRS in (36), coupled with the operation of head–movement (N–incorporation), we straightforwardly get *pit/(de)bone* verbs of this type : the N–incorporation does not violate the constraint on head–movement (i.e., the strict canonical government), moving from NP_2 to V via A (NP_2–A–V).

As we saw above, *pit/(de)bone* verbs are allowed to take COs, as in (38).

(38) a . John boned all the small bones of the fish.
b . John skinned the smooth yellow skin of the banana.

We assume the syntactic devices proposed in H&K (1997) which license externalization of cognate expressions, i.e., index deletion and lexical insertion. The two devices apparently seem to be just theory–internal tools for externalizing cognate expressions. However, it must noted here that any approach to the externalization will be required, whether explicitly or implicitly, to assume some sort of mechanism to license the externalization. H&K's 'index deletion plus lexical insertion' can be seen as an explicitly defined instance of such assumptions. By so defining the assumption as in H&K (1997), we can account not only for possible externalization of cognate expressions but also for the fact that some ways of externalization are impossible. Consider the following examples :

(39) a. *He shelved the books on.
(cf. He put the books on a shelf. He shelved the books.)
b. *He corralled the horses in.
(cf. He put the horses in a corral. He corralled the horses.)
c. *He bottled the wine in.
(cf. He put the wine in bottles. He bottled the wine.)
(H&K (1993 : 60))

With the mechanism of index deletion plus lexical insertion (cf. (30)), the sentences are ruled out because while cutting P–V link forces both P (e.g., *on* in (39a)) and $N(P)_3$ (e.g., *shelf*) to be overtly coded, the $N(P)_3$ is not syntactically realized.[20]

Now the COs in (38) are realized in the following way: firstly, index deletion applies to the link between the $N(P)_2$ and the A–head in (36), cutting away the $N(P)_2$ from the $N(P)_2$–A–V chain; then, through lexical insertion (DP–insertion), the NP_2 is realized overtly as *all the small bones of the fish* in (38a) and *the smooth yellow skin of the banana* in (38b).

We notice here that there is another option for cutting the index link, that is, to cut the A–V link. We expect then that when the index link between A and V in the $N(P)_2$–A–V chain is cut, the operation of lexical insertion makes the A–V link realized syntactically. The following examples show that this expectation is correct.

(40) a. John boned off all the small bones of the fish.
a'. John boned all the small bones of the fish off.
b. John skinned off the smooth yellow skin of the banana.
b'.??John skinned the smooth yellow skin of the banana off.

Now let us turn to the LRS in (37), which contains $NP_1\langle$whole$\rangle$. Application of a series of head–movement on this structure derives denominal verbs as in *John boned the fish* and *John skinned the rabbit. Pit/(de–) bone* verbs of this type cannot take CPPs, relevant examples are provided below.

(41) a. *John boned the fish off all the small bones.
a'. *John boned the fish all the small bones off.
b. *John skinned the banana off the smooth yellow skin.

b'. *John skinned the banana the smooth yellow skin off.

Given the LRS in (37) and the technical tool of index deletion, we wrongly predict that the sentences in (41) could all be acceptable. In explaining the unacceptability of the sentences in (41), we have recourse to the distinction between 'referential' and 'adverbial' interpretations of the denominal verbs.

Kiparsky (1997) observes that there are two different interpretations of denominal verbs, namely 'referential' and 'adverbial' interpretations (cf. H&K (1997)). Let us take the verb *hammer* as an example. The verb *hammer* denotes an activity to strike something with a flat side of a heavy object but the heavy object is not necessarily a hammer. This means that the verb is now understood as having an adverbial meaning. Like this, some denominal verbs lose its nominal content of meaning. Kiparsky classifies instrumental verbs into two : true denominal instrumental verbs and pseudo-instrumental verbs, the latter of which actually denote manner of motion. Pseudo-instrumental verbs are consistent with CPPs (as shown in (42)) whereas true denominal instrumental verbs are not (as in (43)).[21]

(42) a. He hammered the desk with his shoe.
b. He brushed his coat with his hand.
c. I paddled the canoe with a board.
d. String him up with a rope!
e. Can you whistle with a blade of grass?
f. The convict sawed off the bars with her dentures.
g. She anchored the ship with a rock.
h. We wedged the window open with a screwdriver.

(43) a. #She taped the picture to the wall with pushpins.
b. #They chained the prisoner with a rope.
c. #Jim buttoned up his pants with a zipper.
d. #Let's bicycle across France on our tricycles.
e. #Screw the fixture on the wall with nails.
f. #You have to padlock the door with a latch.
g. #He snowplowed the sidewalk with a shovel.

h. #The artist charcoaled the drawing with ink.

(Kiparsky (1997 : 489))

Kiparsky attributes the difference between true and pseudo-instrumental verbs to the ways in which "bleaching effect" shows up in the meaning of a denominal verb : in the former case the nominal content in the verb is bleached, but without "adverbial increment", while in the latter case the "synchronic noun-to-verb derivational relation" is completely lost and the verb comes to carry a specific adverbial component of meaning (which normally denotes manner) (Kiparsky (1997 : 490)).[22] Thus, he claims that the verbs in (42) "really describe a particular kind of activity, a manner of motion", and the externalized cognate nouns "refer to objects whose canonical use is to perform that kind of motion or activity" (p. 489).

Kiparsky's observation provides a clue to solving the problem with *pit/(de)bone* verbs. Concerning externalization of incorporated Ns, we can say that externalization is possible when the synchronic noun-verb derivational relation is lost and denominal verbs come to obtain an adverbial (manner) interpretation.[23] The reason for the unacceptability of CPPs ((41)) is due to the fact that in the sentence with a *pit/(de)bone* verb, it is impossible to eliminate the synchronic relation completely. The reason is as follows : in the case of N-incorporation with such verbs, what is removed from an entity (e.g., *pits, bones, skin*) is considered to be an inalienable part of the entity which is referred to by the object NP (cf. Levin (1997 : 130 f.)). Thus, in (37), the bones which are removed from a fish are necessarily linked to the fish, no matter which bones are picked out. Then, even when N-incorporation takes place, the synchronic relation remains and we cannot expect adverbial incrementation. As a result, the verb cannot be interpreted as having a manner interpretation (though PPs are, basically, allowed).

This implies that if NP_2 is understood as an inalienable part of NP_1, as is the case with *pit/(de)bone* verbs, the index linking NP-A-V cannot be deleted at any point. Then, our analysis can further explain the fact that *pit/(de)bone* verbs cannot appear in the double object construction. As we mentioned above ((34)), *pit/(de)bone* verbs cannot take two object

NPs, the second of which is a CO. The examples are repeated below.

(34) a. *John boned the fish all the small bones.
b. *John skinned the banana its smooth yellow skin.

This means, in our analysis presented above, that the index linking NP–A–V cannot be deleted between N(P) and A. The unacceptability may also be attributed to some constraint on Case assignment of denominal verbs: denominal verbs in general do not assign more than one Case, as shown in (44):

(44) a. He shelved the books *(on) the top shelf.
b. He saddled the horse *(with) a western saddle.
c. He tutored the boy *(as) an English teacher.

Thus, the unacceptability of the sentences in (34) may also be explained by this Case assignment constraint.

Lastly, the unacceptability of the following examples are also in the scope of our analysis.

(45) a. *John boned the fish (off) all the small bones (off).
b. *John skinned the banana (off) its smooth yellow skin (off).

This is because the A–V index link in the chain is not deletable either.[24]

5. Concluding Remarks

In this paper, I have pursued a syntactic approach to the productivity of denominal verbs and the distribution of their cognate expressions. I have proposed that verbs of the *pit/(de)bone* class have two distinct LRSs ((36) and (37)) and those denominal verbs are derived, as is the case with other denominal verbs, through head–movement (N–incorporation) application to the structures. Syntactic realization of cognate expressions is made possible by the operations of index deletion and lexical insertion. As we have seen above, by assuming these operations (coupled with the distinction between the referential and the adverbial interpretation), we can explain explain the distribution of cognate expressions (both COs and CPPs) and even provide an account of the externalization of cognate expressions of *pit/(de)bone* verbs.

Notes

[1]An earlier version of this paper was originally presented at the Tsukuba English Linguistics Colloquium held on January 29, 1998. I would like to thank Minoru Nakau, Yukio Hirose and the audience at that presentation for many comments and suggestions.

[2]In this study, we assume that CPPs in this construction are not necessarily literally 'cognate' with the verb. Some examples of such 'peripheral' cases will be presented below.

[3]The judgment of the CPP construction with a *pocket* class verb varies among native speakers of English. Levin (1993) considers the following sentence less acceptable.

(i) ??Lydia pocketed the change in her left front jacket pocket.
(Levin (1993 : 121))

[4]It seems that verbs of the *mine* class may take cognate expressions in either way. I cannot fully discuss this property of *mine* verbs in this paper.

(i) a. The men were able to mine more gold from the abandoned mine.
b. John mined the abandoned mine.
((ia) is cited from Levin (1993 : 132).)

[5]The verb classes in (9) approximately correspond to the instrument subclass of *wipe* verbs, *captain* verbs, *pocket* verbs, and *butter* verbs, in Levin (1993), respectively.

[6]Kageyama refers to verbs like *skin* as *hakudatu* verb (literally, 'deprive' verb). Since the verb *deprive* shows some different properties with regard to externalization of cognate expressions, we will refer to this type of verbs as, following Levin (1993), *pit/(de)bone* verbs.

[7]Kageyama refers to verbs like *calve* as *shussan* verb (literally, 'breed' verb). We will follow Levin (1993) and refer to this type of verbs as, *calve* verbs.

[8]As for the conversion from an internal argument, Kageyama proposes a linking constraint, which requires that the NP in an adverbial phrase should be linked to either the external argument or the internal argument.

[9]The following examples are cited from Kageyama (1997 : 36).

(i) a. The kettle was steaming (clouds of steam).
b. The chimney was smoking (a strong sulfurous smoke).

As the examples show, the verbs, which are also considered in his analysis to be converted from internal arguments, may take a cognate expression as a CO.

[10]For example, the verb *mine* is analyzed as having the LCS in (23b), and NOT–AT–IN in the LCS is (optionally) syntactically realized as a PP headed by the preposition *from*, as in (ic).

(i) a. mine the gold
b. [ ]x CAUSE [BECOME [the gold BE–NOT–AT–(IN–)[MINE]]

c . John mined the gold from the abandoned mine.

[11]The unacceptability of the example may be due to a violation of the informativity requirement.

[12]We should note here that in the sentence *John boned all the small bones of the fish* the PP *of the fish* is not a complement of the verb but a constituent of the NP complement of the verb ([$_{NP}$ all the small bones [$_{PP}$ of the fish]]). If the NP *all the small bones* is moved through *wh*–movement or heavy NP shift, the resulting sentences deviate because of the violation of the left branch condition (ii) (Ross (1986)).

(i) a .?*[Which bone(s)]$_i$ did John bone [t_i of the fish]?
cf. [Which bone(s) of the fish]$_i$ did John bone t_i?
b .?*John boned [t_i of the fish] [all the small bones that could stick in his throat]$_i$.

(ii) The Left Branch Condition
No NP which is the leftmost constituent of a larger NP can be reordered out of this NP by a transformational rule.
(Ross (1986 : 127))

[13]Baker argues for the base structures of each alternation (the structures in (24) and the one in (25)) with some other syntactic diagnostics, i.e., the secondary predicate construction, *wh*–movement, heavy NP shift, derived nominals, syntactic compound formation, scope interaction of quantifiers, and the phenomenon of unaccusativity. See Baker (1997 : 87 ff.) for a detailed discussion.

[14]In H&K (1993), Head–movement (including N–incorporation as in (27)) is analyzed as being constrained by the Head Movement Constraint in (i).

(i) Head Movement Constraint
An X^0 may move into the Y^0 which properly governs [i.e., antecedent governs] it.

In H&K (1997) this constraint is redefined in terms of "strict canonical government", though the basic idea of the constraint remains the same.

[15]Thus, the unacceptability of the sentences in (i) follows.

(i) a . *It cowed a calf. (cf. A cow had a calf.)
b . *It dusted the horses blind. (cf. The dust made the horses blind.)
c . *He housed a coat of paint. (cf. He gave a house a coat of paint.)

[16]The analysis in this paper predicts that the following examples are also ruled out because of the linear order of the relevant two NPs.

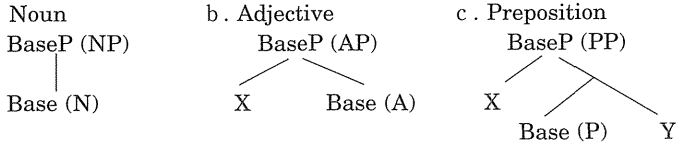
(i) a . John boned all the small bones off the fish.
b . John skinned the smooth yellow skin off the banana.

The judgment of the examples vary among speakers ; some speakers observe that the sentences above are slightly better than the examples in (35). I cannot provide a full examination of the examples in (i) in this paper.

[17]Harley (1995) argues that Base Phrases (which corresponds to the XP sis-

ter to the V–head in the LRS) are classified into three : NP, AP, and PP. The N–head of NP denotes an entity expression ; the A–head of AP is a predicate, and thus takes one argument (X) ; the P–head of PP takes a complement (Y) and forms a predicate ; and the predicate, in turn, takes one argument (X). With tree diagrams, they are represented as in (i). (See also H&K (1993, 1997).)

(i) a . Noun b . Adjective c . Preposition



(cf. Harley (1995 : 103 f.))

[18]The A–head OFF in (36) is instantiated as *off* in the following examples ; the intended meaning of the A–head is the same as *off* in (i) does have.

(i) a . The door handle fell *off*.
b . How do you get this lid *off*?

[19]Head–movement from A–head to V–head is possible. We consider that de–adjectival verbs, as in the following examples, are derived through head–movement of A–head (i.e., A–incorporation).

(i) a . John *narrowed* the path.
b . John *fattened* his pigs.

It should also be noticed here that the examples above show that the argument of the A–head in its base position (i.e., NP_2 in (36)) is syntactically realized as object.

[20]In Hale and Keyser (1993), the unacceptability of the sentences is attributed to a violation of the Head Movement Constraint : the N–head makes a wrong movement (i.e., skipping the P–head).

[21]It should be noted here that Kiparsky's claim that the meaning of true denominal verbs like those in (42) is 'referential' does not imply that those verbs have inherited some'referential value'from the incorporated nominals (N–heads). We assume here that the nominals do not have any referential value at all (though they specify the type of an entity), and hence there never occurs inheritance of referential value to the V–head. This assumption is consistent with H&K's analysis. H&K assumes that the nature of LRS is by definition a system of structural "relations holding between the head, its categorial projections and its arguments", and thus there is no room in the LRS for functional heads, including the D–head, which is the locus of referentiality (cf. Chomsky (1995)). Hence no referential value for the nominal to be incorporated into the V–head (cf. Nogawa (1995)). I thank Yukio Hirose (personal communication) for bringing my attention to the lack of referential value of incorporated nominals.

[22]Kiparsky attributes the contrast between (42) and (43) to a lexical

constraint which he refers to as the lexicalization constraint.

(i) The lexicalization constraint: A verb can inherently express at most one semantic role (theme, instrument, direction, manner, path...).

By assuming this constraint, we can explain the deviant status of (iid) and (iii d). See Kiparsky (1997: 490f.) for a detailed discussion.

(ii) a. John climbed up the mountain.
b. John climbed down the mountain.
c. The train climbed up the mountain.
d. #The train climbed down the mountain.

(iii) a. The disabled car was towed away with a rope.
b. The injured skier was towed away with a rope.
c. The disabled car was towed away on a flatbed truck.
d. #The injured skier was towed away on a flatbed truck.

[23]Here we must consider that although the operation of index deletion cuts the chain of the N–head, the V–head inherits the meaning of the N–head. This inheritance makes the appropriate manner interpretation of a denominal verb. Since the N–head is merged with the V–head (whether or not index deletion applies), its (nominal) meaning is necessarily integrated into the verb, and thus affects the manner interpretation. That is, denominal verbs inherit the manner of the activity in which the entity denoted by a N–head is involved. I thank Yukio Hirose (personal communication) for bringing my attention to this point.

[24]The following examples may also be explained with the referential/adverbial distinction in denominal verbs, since the realization of *off* implies an application of index deletion, which is not available here.

(i) a. *John boned off the fish.
a'. *John boned the fish off.
b. ?*John skinned off the banana.
b'. *John skinned the banana off.

References

Buck, R. A. (1993) "Affectedness and Other Semantic Properties of English Denominal Locative Verbs," *American Speech* 68, 139–160.

Baker, M. C. (1988) *Incorporation: A Theory of Grammatical Function Changing*. University of Chicago Press, Chicago.

Baker, M. C. (1997) "Thematic Roles and Syntactic Structure," ms., McGill University.

Clark, E. V. and H.H. Clark (1979) "When Nouns Surface as Verbs," *Language* 55, 767–811.

Chomsky, N. (1995) *The Minimalist Program*. MIT Press, Cambridge, Massachusetts.

Hale, K. and S. J. Keyser (1993) "On Argument Structure and the Lexical Expression of Syntactic Relation," in K. Hale and S. J. Keyser (eds.) (1993) *The View from Building* 20. MIT Press, Cambridge, Massachusetts.

Hale, K. and J. Keyser (1997) "On the Complex Nature of Simple Predicators," in A. Alsina, J. Bresnan, and P. Sells (eds.) (1997) *Complex Predicates*. CSLI, Stanford, California.

Harley, H. (1995) Subjects, Events and Licensing. Doctoral dissertation, MIT, Cambridge, Massachusetts.

Jackendoff, R. (1990) *Semantic Structures*. MIT Press, Cambridge, Massachusetts.

Jackendoff, R. (1997) *The Architecture of the Language Faculty*. MIT Press, Cambridge, Massachusetts.

Kageyama, T. and Y. Yumoto (1997) *Go-Keisei-to Gainen-Kouzou* (*Word-Formation and Conceptual Structures*). Kenkyusha, Tokyo.

Kiparsky, P. (1997) "Remarks on Denominal Verbs," in A. Alsina, J. Bresnan, and P. Sells (eds.) (1997) *Complex Predicates*. CSLI, Stanford, California.

Levin, B. (1993) *English Verb Classes and Alternations*. University of Chicago Press, Chicago.

Nogawa, K. (1995) "Cognate Objects and Island Effects," *Tsukuba English Studies* 14, 111–140.

Quirk, R., S. Greenbaum, G. Leech, and J. Svartvik. (1985) *A Comprehensive Grammar of the English Language*. Longman, London.

Rappaport, M. and B. Levin (1988) "What to Do with θ-Roles," in W. Wilkins (ed.) (1988) *Syntax and Semantics* 21: *Thematic Relations*. Academic Press, New York.

Rice, S. A. and G. Prideaux (1991) "Event-Packing: The Case of Object Incorporation in English," *Berkeley Linguistics Society* 17, 283–298.

Roeper, T. and M. E. A. Siegel (1978) "A Lexical Transformation for Verbal Compounds," *Linguistic Inquiry* 9, 199–260.

Ross, J. R. (1986) *Infinite Syntax*. Ablex, Norwood, New Jersey.

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